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TITLE : SPUTTERING TARGET MATERIAL FOR FORMING BI-SR-TA-O FERROELECTRIC THIN FILM AND FORMATION USING IT

ABSTRACT : PROBLEM TO BE SOLVED: To form a ferroelectric thin film having a wide area small in the dispersion in the content of Bi components by using a warm press formed body having a specified compsn. of metallic Bi powder having specified grain size and a powdery mixture of metallic Bi powder and Sr-Ta multiple oxide as a sputtering target material.

SOLUTION: A powdery mixture obtd. by blending SrO and Ta₂O₅ in a prescribed ratio is baked at about 1000 to 1400°C in the air to obtain Sr-Ta multiple oxides of Sr_xTa₂O_{5+x} {(x) is 0.8 to 1.2}. This multiple oxide powder is blended with a prescribed amt. of metallic Bi powder having 1 to 100 μm average grain size, this powdery mixture is subjected to warm press forming at about 200 to 250°C under the pressure of about 100 to 200 kgf/cm² in a vacuum of about 10⁻² Torr to obtain a formed body having a structure in which multiple oxides are uniformly dispersed and distributed into a Bi base of Bi: 0.8 to 2.0 atomic ratio and having ≥99.5 theoretical density. This warm press formed body is used as a target, and sputtering is executed to form a Bi-Sr-Ta- O series ferroelectric thin film having a prescribed compsn.

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